

5 **REMARKS/ARGUMENTS**

Claims 1-6, 8, 12, 14-17, 19-25 and 27-41 remain in the application.

Claims 1, 5, 6, 8 and 28 are amended.

Claim 38 is currently cancelled.

Claims 42 and 43 are newly presented.

10 **Claim Objections**

The Examiner is thanked for withdrawal of the objection as to claim 30.

**Claim Rejections Under 35 USC § 102**

Claims 1-6, 8, 14-16, 20-23, 28-30, 32-35 and 37-41 were rejected under 35 USC § 102(b) over US Patent 5,745,054 to Wilkens, et al. (hereinafter "Wilkens").

15 The invention as currently recited in claim 1 is believed to be patentable over Wilkens, which teaches an aircraft display system that positions a synthetic runway on a display in alignment with a target runway. The system of Wilkens computes a lateral deviation rate of the host aircraft relative to an extended centerline of a target runway. Wilkens also teaches computing a ground track of the aircraft, and a track error angle representative of a difference between the  
20 extended centerline of the runway and the ground track of the aircraft. Runway bearing relative to ground track is computed from the track error angle and lateral deviation angle. See, e.g., Abstract.

The present invention, as recited in amended claim 1, is an airport lighting aid simulation generator that now includes: means for determining a glide path as a function of runway position  
25 and direction information retrieved from a database of airport information, as well as means for determining deviation from the glide path as a function of comparing the position and altitude information with the glide path, and means for outputting a signal representative of the deviation from the glide path.

Wilkens clearly does not and cannot anticipate the invention recited in claim 1 as currently  
30 amended. Wilkens does not teach any means for determining a glide path as a function of airport information retrieved from runway position and direction information retrieved from the database, as currently recited in claim 1. Rather, Wilkens teaches computing an "actual glide path angle" using a glide path derived from an "on-board ILS system." See, e.g., Wilkens at column 4, lines 54-32, reproduced herein below:

5            Glide path angle is derived from the on board ILS system and runway specific  
glide path data provide by either an on board data base or the pilot. The ILS  
system provides deviation data representative of the angular deviation of the  
aircraft from the glide slope signal. The on board data base provides the angle  
of the glide slope angle of the specific approach being used. Adding the  
10        deviation angle and the glide slope angle yields the actual glide path angle of  
the aircraft. Wilkens at column 4, lines 24-32 (emphasis added).

Additionally, the Examiner admitted in the Office Action dated January 12, 2006, that  
Wilkens relies on the ILS system for deriving the glide path. See, page 2.

It is well-known that an on-board ILS system is based on receiving signals from  
15        on-ground radio beacons, known as “localizers.” See, e.g., paragraph [0003] of the present  
application, reproduced herein below:

20            The ILS is a radio beam that originates on the ground at an ILS equipped  
airport and generates a glide slope that an aircraft can safely follow during an  
instrument approach to the runway. The ILS radio beam is detected by  
equipment onboard the aircraft and provides lateral, along-course, and vertical  
guidance to aircraft attempting to land at an ILS equipped airport. However,  
not all airport runways have an ILS generated radio glideslope. [0003]

25            This operation of the ILS system is supported by Wilkens, which states: “The preferred  
embodiment uses an ILS system to provide localizer deviation which is used for the lateral  
deviation angle.” Wilkens at column 4, lines 64-66 (emphasis added).

In fact, the examiner agrees with the applicant. The examiner has admitted that the ILS is  
a “well known **ground-based** radio system designed to provide an airplane pilot with precise  
guidance for the final approach in landing.” See, Office Action at page 15 (emphasis is in  
original).

30            Thus, Wilkens only teaches a system that relies on information (ILS radio beam) that is  
not runway position and direction information retrieved from the database of airport information.  
Specifically, Wilkens teaches using a radio signal from an ILS beacon that is “on the ground at an  
ILS equipped airport” and is “detected by equipment onboard the aircraft,” as described in

5 paragraph [0003]. Wilkens uses this ground-based ILS signal to derive a glide path angle that is used in turn to compute an “actual glide path angle.” Wilkens at column 4, lines 24-32.

In contrast, the present invention as recited in claim 1, the glide path is determined “as a function of runway position and direction information retrieved from the database of airport information.”

10 Wilkens does not and cannot teach “a means for determining a glide path as a function of the runway position and direction information retrieved from the database of airport information,” as recited in claim 1, at least because Wilkens teaches that the “Glide path angle is derived from the **on board ILS** system.” Wilkens at column 4, line 24. Wilkens teaches computing the “actual glide path angle” only after the “Glide path angle is derived from the **on board ILS** system,” as  
15 shown by Wilkens at column 4, lines 30-32: “Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft.”

For at least the above reasons, claim 1 as presently amended is patentable over Wilkens.

Furthermore, the invention of claim 1 is distinguished from Wilkens in that Wilkens teaches the glide path being provided by the ILS, as shown by: “Navigation system (e.g. ILS) 62B  
20 provides glide slope deviation and localizer deviation data.” Wilkens at column 6, lines 29-33 (emphasis added). Thus, Wilkens does not “determine” deviation from the glide slope, but rather Wilkens teaches that “glide slope deviation and localizer deviation data” are provided by the ILS, which is a ground-based radio system, as discussed in the Specification at paragraph [0003] and reprinted above.

25 In contrast, claim 1 actually recites “a means for determining deviation from the glide path as a function of comparing the position and altitude information with the glide path.”

Thus, claim 1 is further distinguished from Wilkens as reciting “determining” deviation from the glide path, rather than merely receiving the information “provided” by an ILS system as taught by Wilkens.

30 Additionally, Wilkens cannot teach “determining deviation from the glide path as a function of comparing the position and altitude information with the glide path” as recited in amended claim 1 at least because Wilkens teaches that: “The ILS system provides deviation data representative of the angular deviation of the aircraft from the glide slope signal.” Column 4, lines 26-28.

5 For at least these additional reasons, claim 1 is patentable over Wilkens.

Claims 2-6 are allowable at least as depending from now allowable claim 1.

Claim 3 is additionally allowable independently of allowable base claim 1 as reciting “a means for displaying the deviation as a pattern of color coded indicators.” As discussed herein above, Wilkens does not teach display means for indicating deviation from glide slope “as a  
10 pattern of color coded indicators.” Rather, Wilkens only teaches the glide slope only as an input to a computation of distance to runway. See, e.g., Wilkens at column 4, lines 8-12, and claim 11.

Furthermore, Wilkens does not teach displaying any information as a “pattern of color coded indicators,” as recited in amended claim 3. Rather, Wilkens only teaches the display 60 as including an overhead unit portion 60A, a brightness control 60B, and a combiner or display  
15 screen 60C. Overhead unit 60A receives symbology commands from symbol generator 61 and converts these symbology commands to graphic symbols for display on combiner 60C. Wilkens at column 6, lines 9-19, reproduced herein below:

Display 60 is illustrated as a head up display having an overhead unit portion 60A, a brightness control 60B, and a combiner 60C (also generically referred  
20 to as a display screen). Overhead unit 60A receives symbology commands from symbol generator 61. The symbology commands are converted into graphic symbols which are projected onto combiner 60C. Combiner 60C is positioned between the pilot 63 and the windshield of the aircraft so that the pilot can simultaneously view both the synthetic runway symbology and the  
25 outside world. Wilkens at column 6, lines 9-19 (emphasis added).

Thus, Wilkens only teaches a means for visually displaying information.

The examiner mistakenly relies on the above citation of Wilkens at column 6, lines 9-19 to show that Wilkens teaches displaying any information as a “pattern of color coded indicators,” as recited in amended claim 3. Furthermore, the examiner tries to combine the “graphic symbols”  
30 displayed on Display 60 with calculation of deviation to prove that “what is shown in Figure 2 is representative of a pattern of color coded indicators.” Office Action at page 5. However, there is **absolutely nothing** in either Figure 2 or the description in Wilkens at column 6, lines 9-19 to even vaguely teach displaying any information as a “pattern of color coded indicators,” as recited in amended claim 3.

5           Wilkins does not teach displaying the deviation as a pattern of color coded indicators, as originally recited in claim 3. Rather, Wilkins only teaches that “symbology commands are converted into graphic symbols,” and that the graphic commands are “projected onto combiner 60C.” See, Wilkins at column 6, lines 9-19, which is reproduced herein above.

10           Thus, the examiner must use impermissible hindsight to say that Wilkins teaches any “displaying the deviation as a pattern of color coded indicators,” as recited in claim 3.

For at least these additional reasons, claim 3 is patentable over Wilkins at least because Wilkins does not teach any means for displaying the deviation as a pattern of color coded indicators.

Thus, claim 3 is additionally allowable independently of allowable base claim 1.

15           Claim 4 is additionally allowable independently of allowable base claim 1 as reciting “means for displaying information as to a degree of deviation from the glide path as a visual image relative to the pattern of color coded indicators.” In contrast, Wilkins only teaches using angular deviation of the aircraft from the glide slope for computing the actual glide path angle of the aircraft. See, e.g., Wilkins at column 4, lines 24-32, reproduced below:

20           Glide path angle is derived from the on board ILS system and runway specific glide path data provide by either an on board data base or the pilot. The ILS system provides deviation data representative of the angular deviation of the aircraft from the glide slope signal. The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the  
25           deviation angle and the glide slope angle yields the actual glide path angle of the aircraft. Wilkins at column 4, lines 24-32.

Thus, Wilkins does not teach any means for determining a degree of deviation from the glide path, and furthermore does not teach any means for displaying the degree of deviation. Furthermore, Wilkins absolutely does not teach displaying information as to a degree of deviation  
30           from the glide path “as a visual image relative to the pattern of color coded indicators,” as recited in amended claim 4.

The examiner relies on the same arguments made against claim 3 to reject claim 4. However, as discussed above, the examiner must be relying on **impermissible hindsight** to find any teaching in Wilkins for displaying information as to a degree of deviation from the glide path

5 “as a visual image relative to the pattern of color coded indicators,” as recited in amended claim 4. As discussed above regarding claim 3, Wilkens only teaches a display (combiner 60C) with “graphic symbols” projected onto it. There is absolutely no teaching of displaying deviation from the glide path information “as a visual image relative to the pattern of color coded indicators,” as recited in amended claim 4.

10 At least because Wilkens does not teach any means for displaying information as to a degree of deviation from the glide path, nor any means for displaying the information as a visual image relative to the pattern of color coded indicators, claim 4 is clearly allowable independently of allowable base claim 1.

Claim 5 is additionally allowable independently of allowable base claim 1 as reciting “the  
15 means for determining a glide path further comprises means for generating the glide path as a combination of the runway position and direction with the position and altitude information.

In contrast, as discussed above, Wilkens only teaches deriving the glide path angle from the “on board ILS system and runway specific glide path data provide by either an on board data base or the pilot,” and computing the “actual glide path angle” by “[a]dding the deviation angle  
20 and the glide slope angle.” Column 4, lines 24-32.

Thus, Wilkens does not teach any means for generating the glide path as a combination of the runway position and direction with the position and altitude information, as recited in amended claim 5. Therefore, claim 5 is clearly allowable independently of allowable base claim 1.

Independent claim 8 differs in scope from allowable claim 1. However, the above  
25 arguments directed to claim 1 are sufficiently applicable to claim 8 as to make repetition unnecessary. Thus, for each of the reasons above, claim 8 is believed to be allowable over the cited art.

In contrast to the generator being structured to “output a signal representative of a degree of coincidence with the glide path as a function of comparing the position and altitude signals with  
30 the glide path information” as recited in claim 8, Wilkens only teaches “Navigation system (e.g. ILS) 62B provides glide slope deviation and localizer deviation data.” Column 6, lines 29-33. Thus, Wilkens does not teach a signal generator determining glide slope deviation because the ILS “provides glide slope deviation.”

For at least the above reasons, claim 8 is believed to be allowable.

5           Claim 8 is amended only to further clarify the device. The allowable subject matter discussed above was present in claim 8 as originally filed. Therefore, the present amendment of claim 8 is not believed to be necessary for the allowance and patentability of the claim.

          Claim 12 is allowable at least as depending from allowable independent claim 8.

          Furthermore, claim 12 is additionally allowable independently of allowable base claim 8 as  
10   reciting the illuminated indicators being “positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach.” As discussed herein above relative to claim 3, Wilkens clearly does not teach display means for indicating deviation from glide slope. Thus, Wilkens does not and cannot teach illuminated indicators being  
15   “positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach,” as recited in claim 12.

          For at least these additional reasons, claim 12 is believed to be allowable independently of allowable base claim 8.

          Claim 14 recites “comparing the position and elevation data to the glide path, and generating a signal representative of deviation of the position and elevation data from the glide  
20   path,” as originally filed.

          In contrast, as discussed hereinabove and *as the examiner has repeated over and over in the Office Action*, Wilkens only teaches that the ILS “provides glide slope deviation and localizer deviation data.” Column 6, lines 29-33(emphasis added). Thus, Wilkens does not teach  
25   “comparing the position and elevation data to the glide path, and generating a signal representative of deviation of the position and elevation data from the glide path,” as originally recited in claim 14. Wilkens has no teaching for “comparing the position and elevation data to the glide path,” as originally recited in claim 14. Wilkens also has no teaching for “generating a signal representative of deviation of the position and elevation data from the glide path,” as originally recited in claim 14.

30           For at least the above reasons, claim 14 is believed to be allowable as originally filed without amendment.

          Claims 15 and 16 are allowable at least as depending from allowable independent claim 14.

          Independent claim 20 differs in scope from allowable claim 14. However, the above arguments directed to claim 14 are sufficiently applicable to claim 20 as to make repetition

5 unnecessary. Thus, for each of the reasons above, claim 20 is believed to be allowable over the cited art.

Claims 21-23 are allowable at least as depending from allowable independent claim 20.

10 Claim 23 is additionally allowable independently of allowable base claim 20 as reciting “sixth computer-readable program code means for interpreting the signal output by the fifth computer-readable program code means as a pattern of color coded indicators on a cockpit display.” Claim 23 differs in scope from allowable claim 3. However, the above arguments directed to claim 3 are sufficiently applicable to claim 23 as to make repetition unnecessary. Thus, for each of the reasons above, claim 23 is believed to be allowable independently of allowable base claim 20.

15 Claim 24 is additionally allowable independently of allowable base claim 20 as reciting “the pattern of display indicators simulates a known airport lighting aid.” In contrast, as discussed above in regard to claims 3 and 12, Wilkens does not teach display means for indicating deviation from glide slope. Therefore, Wilkens does not and cannot teach any “pattern of display indicators simulates a known airport lighting aid,” as recited in claim 24.

20 For at least these additional reasons, claim 24 is believed to be allowable independently of allowable base claim 20.

Independent claim 28 differs in scope from allowable claim 14. However, the above arguments directed to claim 14 are sufficiently applicable to claim 28 as to make repetition unnecessary. Thus, for each of the reasons above, claim 28 is believed to be allowable over the  
25 cited art.

Claims 29, 30 and 32-35 are allowable at least as depending from allowable base claim 28.

Claims 37-41 are rejected as being anticipated by Wilkens. See, Office Action at page 2. However, the Office Action does not provide any specific explanation of the rejection. See, Office Action at page 13.

30 Therefore, the applicant can only make the following general statements as to the allowability of claims 37-41.

Claim 38 is cancelled whereby the rejection is made moot as to this claim.

Claims 37 and 39-41 are all allowable at least as depending from allowable base claim 8.



5           Claim 37 is further allowable as further limiting the display of claim 8. Wilkens does **not** disclose or suggest “illuminated degree of deviation indicator indicating a degree of deviation from coincidence with the glide path, the illuminated degree of deviation indicator being positioned relative to the pattern of illuminated indicators simulating a known airport lighting aid,” as recited in new claim 37. Rather, as discussed above, Wilkens teaches the display 60 displaying a “runway bearing.” See, Wilkens at column 6, lines 19-26, which is reproduce herein above.

          Henry, as discussed above, only teaches replacing the visible light generated by the runway lights with a microwave counterpart of such image as a simulated display on a CRT or image scan. See, e.g., Henry at column 3, lines 21-53, which is reproduce herein above. Thus, Henry 15 fails to provide **any** deficiencies of Wilkens as to “an illuminated degree of deviation indicator indicating a degree of deviation from coincidence with the glide path, the illuminated degree of deviation indicator being positioned relative to the pattern of illuminated indicators simulating a known airport lighting aid,” as recited in claim 37.

          Claims 39-41 all differ in scope from allowable claim 37. However, the above arguments 20 directed to claim 37 are sufficiently applicable to claims 39-41 as to make repetition unnecessary. Thus, for each of the reasons above, all of claims 39-41 are believed to be allowable.

#### Claim Rejections Under 35 USC § 103

          Claims 12, 17, 19, 24, 25, 27, 31 and 36 were rejected under 35 USC § 103(a) over US Patent 5,745,054 to Wilkens, et al. in view of US Patent 4,210,930 to Henry (hereinafter “Henry”).

25           The invention as originally presented is patentable over both Wilkens and Henry, individually and in combination.

          As discussed above, Wilkens does not teach any means for outputting a signal representative of a degree of coincidence with the glide path as a function of comparing the position and altitude signals with the glide path information, as currently recited in base claim 8 30 from which claim 12 depends.

          Claim 12 is allowable at least as depending from allowable base claim 8.

          Furthermore, Wilkens does not teach that “the illuminated indicators are positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach,” as originally recited in claim 12.

5           Furthermore, the examiner admitted that the ILS is a “well known **ground-based** radio system designed to provide an airplane pilot with precise guidance for the final approach in landing.” See, Office Action at page 15 (emphasis is in original). The examiner also stated at page 15 of the Office Action that Henry and Wilkens can be combined *because* they are **both** ground-based systems.

10           Therefore, Henry and Wilkens both fail to anticipate the entirely on-board apparatus of the claimed invention.

          Claim 12 is allowable at least as depending from allowable base claim 8.

          Furthermore, claim 12 is additionally allowable independently of allowable base claim 8 as reciting the illuminated indicators being “positioned on the display to appear in positions  
15       consistent with ground-based airport lighting aids as seen on approach.” As discussed herein above relative to claim 3, Wilkens does not teach display means for indicating deviation from glide slope. Thus, Wilkens does not and cannot teach illuminated indicators being “positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach,” as recited in claim 12.

20           Henry also fails to disclose or suggest the illuminated indicators being “positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach,” as originally recited in claim 12. Rather, Henry only teaches replacing the visible light generated by the runway lights with a microwave counterpart of such image as a simulated display on a CRT or image scan within the cockpit of the aircraft. See, e.g., Henry at column 3, lines 21-  
25       53 (reproduced herein above). The simulated display as taught by Henry is not “a visual indication of the degree of coincidence with the glide path,” as recited in claim 8.

          Rather, Henry teaches that it is the *pilot* that monitors the microwave counterparts on the display and then independently detects any deviation from the glide path. Therefore, Henry fails to disclose or suggest a display structured to “output a visual indication of the degree of coincidence  
30       with the glide path,” as recited in claim 8.

          Because Henry requires the *pilot* to independently detect any deviation from the glide path, Henry obviously fails to disclose or suggest illuminated indicators being “positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach,” as recited in claim 12.

5 For at least the above reasons, claim 12 is believed to be allowable independently of allowable base claim 8.

Independent claims 14, 20 and 28 all differ in scope from allowable claim 1. However, the above arguments directed to claim 1 are sufficiently applicable to claims 8, 14, 20 and 28 as to make repetition unnecessary. Thus, for each of the reasons above, all of claims 8, 14, 20 and 28  
10 are believed to be allowable over the cited art.

Claims 17 and 19 are allowable at least as depending from allowable base claim 14.

Claims 24, 25 and 27 are allowable at least as depending from allowable base claim 20.

Claims 31 and 36 are allowable at least as depending from allowable base claim 28.

#### Newly Presented Claims

15 Newly presented claim 42 is allowable at least as depending from allowable base claim 1.

Newly presented claim 42 is further allowable as further limiting the navigation signals used for determining deviation from the glide path to being exclusive of an Instrument Landing System (ILS) signal. Since Wilkens clearly teaches the glide path angle being “derived from the on board ILS system,” Wilkens obviously cannot anticipate, disclose or suggest determining  
20 deviation from the glide path to being exclusive of an Instrument Landing System (ILS) signal.

For at least the above reasons, claim 42 is believed to be allowable independently of allowable base claim 1 and allowance is respectfully requested.

Newly presented claim 43 is allowable at least as depending from allowable base claim 8.

Newly presented claim 43 is further allowable as limiting the navigation signals to being  
25 exclusive of an Instrument Landing System (ILS) signal. The above arguments directed to claim 42 are sufficiently applicable to claim 43 as to make repetition unnecessary. Thus, for each of the reasons above, claim 43 is believed to be allowable independently of allowable base claim 8 and allowance is respectfully requested.

#### Claim Fees

30 Seven claims (7, 9-11, 13, 18 and 26) were previously cancelled. Six claims (36-41) were previously added. Additionally, claim 38 is cancelled. Therefore, the applicant is entitled to add two new claims without an additional extra claim fee being due.

Therefore, the applicant believes that no extra claim fee is due for newly presented claims 42 and 43.

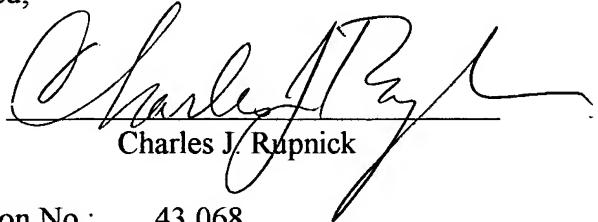
Serial No. 10/052,716  
RCE and Amdt. dated April 10, 2006  
Reply to Office action of January 12, 2006

The claims now being in form for allowance, reconsideration and allowance is respectfully requested.

If the Examiner has questions or wishes to discuss any aspect of the case, the Examiner is encouraged to contact the undersigned at the telephone number given below.

Respectfully submitted,

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